

Applicant: Dietmar BAUMANN et al.
Docket No. R.306271
Preliminary Amdt.

AMENDMENTS TO THE SPECIFICATION:

Page 1, please add the following new paragraphs before paragraph [0001]:

- [0000.2] CROSS-REFERENCE TO RELATED APPLICATIONS
- [0000.4] This application is a 35 USC 371 application of PCT/DE 2004/002541 filed on November 18, 2004.

Please replace paragraph [0001] with the following amended paragraph:

- [0001] Specification **BACKGROUND OF THE INVENTION**

Please replace paragraph [0002] with the following amended paragraph:

- [0002] Prior Art **Field of the Invention**

Please replace paragraph [0003] with the following amended paragraph:

- [0003] The present invention relates to a self-boosting electromechanical vehicle brake ~~having the characteristics of the preamble to claim 1, which is~~ including disc brakes and other types of brakes intended for use particularly in motor vehicles.

Please add the following new paragraph after paragraph [0003]:

- [0003.5] Description of the Prior Art

Please delete paragraph [0004].

Please replace paragraph [0005] with the following amended paragraph:

- [0005] One vehicle brake known from German Patent Disclosure DE 101 51 950 A1 is embodied as a disk brake. [[The]] This known vehicle brake has an electric motor and a spindle drive as its electromechanical actuating device for pressing a friction brake lining against a brake disk for generating a brake force. The brake disk forms a brake body for the vehicle brake. A step-down gear may be connected between the electric motor and the

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spindle drive. The spindle drive forms a rotation/translation speed-changing gear. In addition, for pressing the friction brake lining against the brake body, still other rotation/translation speed-changing gears are possible, such as a rotatable cam. It is also conceivable for example to replace the electric motor with an electromagnet.

Page 3, please replace paragraph [0009] with the following amended paragraph:

~~[0009] Explanation and Advantages of the Invention~~

SUMMARY AND ADVANTAGES OF THE INVENTION

Please replace paragraph [0010] with the following amended paragraph:

~~[0010] In the vehicle brake of the invention having the characteristics of claim 1, the wedge is not fixedly connected to the friction brake lining; instead, the wedge and the friction brake lining are movable counter to one another. A slaving device has the effect that the wedge rotates with the friction brake lining in the one direction of rotation of the brake body, in which the self-boosting device is operative. As a result, the self-boosting action as explained above in terms of the prior art is attained. In the opposite direction of rotation of the brake body, the friction brake lining is displaceable relative to the wedge. As a result, self-fading of the vehicle brake does not occur; instead, the friction brake lining is pressed against the brake body with the contact pressure that is exerted by the actuating device. The vehicle brake of the invention thus has the advantage that it has a self-boosting in one direction of rotation of the brake body while in the other direction of rotation it is neutral in terms of self-help.~~

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Page 4, please delete paragraph [0012].

Please replace paragraph [0013] with the following amended paragraph:

[0013] According to ~~claim 3~~ one embodiment, the actuating device acts on the friction brake lining indirectly via the wedge; that is, for actuating the vehicle brake, the wedge is displaced. This has the advantage that the actuation direction is independent of a direction of rotation of the brake body.

Please replace paragraph [0014] with the following amended paragraph:

[0014] ~~Claim 4 contemplates a~~ A wear compensating device may be used, providing[.]
[[It]] [[has]] the advantage that an actuation and displacement travel of the wedge and of the friction brake lining are not made longer from wear of the friction brake lining.

Page 5, please replace paragraph [0015] with the following amended paragraph:

[0015] Drawing **BRIEF DESCRIPTION OF THE DRAWINGS**

Please replace paragraph [0016] with the following amended paragraph:

[0016] The invention is described below in detail ~~in terms of an exemplary embodiment~~
herein below in conjunction with the drawing. Shown are: drawings, in which:

Please replace paragraph [0017] with the following amended paragraph:

[0017] Fig. 1[[,]] is a simplified schematic view of a vehicle brake of the invention in its unactuated state, looking radially to an imaginary axis of rotation of a brake disk;

Please replace paragraph [0018] with the following amended paragraph:

[0018] Fig. 2[[,]] shows the vehicle brake of Fig. 1 in its actuated state;

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Please replace paragraph [0019] with the following amended paragraph:

[0019] Fig. 3[[],] shows the vehicle brake of Fig. 1 in its actuated state with the reverse direction of rotation of the brake disk;

Please replace paragraph [0020] with the following amended paragraph:

[0020] Fig. 4[[],] shows a modified embodiment of the vehicle brake of Fig. 1 of the invention; and

Please replace paragraph [0021] with the following amended paragraph:

[0021] Fig. 5[[],] is a further modification of the vehicle brake of Fig. 1 of the invention.

Please replace paragraph [0022] with the following amended paragraph:

[0022] Description of the Exemplary Embodiments

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Page 6, please replace paragraph [0024] with the following amended paragraph:

[0024] Two friction brake linings 24, 26 rest in the brake caliper 12. One [- fixed -] friction brake lining 24 is disposed fixedly, i.e., immovably, on a side of one of the two brake lining mounting plates 18 facing toward the brake disk 16. The other - movable - friction brake lining 26 is movable parallel and transversely to the brake disk 16; it is located in the brake caliper 12 on a diametrically opposite side of the brake disk 16 from where the fixed friction brake lining 24 is located.

Please replace paragraph [0025] with the following amended paragraph:

[0025] A wedge 28 is located on a side, facing away from the brake disk 16, of the movable friction brake lining 26 and is displaceable relative to the movable friction brake lining 26

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and relative to the brake caliper 12. On a side facing toward the wedge 28, the brake lining mounting plate [[28]] **20** has an oblique face 30, which forms an abutment for the wedge 28. The oblique face 30 extends at an angle obliquely to the brake disk 16 that corresponds to a wedge angle α of the wedge 28. The wedge 28 is displaceably along the oblique face 30. To reduce friction, cylindrical roller bodies 32, 34 are located both between the wedge 28 and the movable friction brake lining 26 and between the wedge 28 and the oblique face 30, forming the abutment, of the brake caliper 12. If the movable friction brake lining 26 is pressed for braking against the brake disk 16, it is braced via the roller bodies 32, the wedge 28, and the roller bodies 34 on the oblique face 30 of the brake caliper 12. The wedge 28 and the oblique face 30 form a wedge mechanism 28, 30 and a mechanical self-boosting device 36, whose mode of operation will be further described hereinafter.

Page 7, please replace paragraph [0027] with the following amended paragraph:
[0027] The movable friction brake lining 26 has a slaving device 44 for the wedge 28, and this slaving device protrudes from a side, facing away from the brake disk 16, of the friction brake lining 26. The slaving device 44 causes the wedge 28 to be slaved to the movable friction brake lining 26 in one direction, while conversely in the opposite direction a relative motion is possible between the movable friction brake lining 26 and the wedge 28. The slaving device [[24]] **44** moves the wedge 28 in the direction in which the wedge 28 moves along the oblique face 30 obliquely toward the brake disk 16.

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Page 8, please replace paragraph [0029] with the following amended paragraph:

[0029] The function of the disk brake 10 of the invention will now be explained in terms of Fig. 2; it is assumed that the brake disk 16 is rotating in the direction of the arrow 48, or in other words to the left in terms of the drawing. For actuating the disk brake 10, the wedge 28 is displaced parallel to the oblique face 30 and obliquely toward the brake disk 16; given the assumed direction of rotation 48 of the brake disk 16 to the left, the wedge 28 is likewise displaced to the left. The movable friction brake lining 26 is lifted from the travel limiter 46 in the process. Since the wedge 28 is moving obliquely toward the brake disk 16, it presses the movable friction brake lining 26 against the brake disk 16. Because of the pressing of the movable friction brake lining 26 against the brake disk 16, the brake caliper 12, embodied as a floating caliper, is displaced in a manner known per se in its guides [[15]] **14** transversely to the brake disk 16 and presses the fixed friction brake lining 24 against the diametrically opposite side of the brake disk 16. The brake disk 16 is braked.

Page 9, please replace paragraph [0031] with the following amended paragraph:

[0031] The actuation of the disk brake 10 in the reverse direction of rotation 49 of the brake disk 16 is shown in Fig. 3. Here once again the movable friction brake lining 26 is pressed against the brake disk 16 by displacement of the wedge 28 in the direction of the narrowing wedge gap between the oblique face 30 and the brake disk 16. The direction of displacement of the wedge 28 for actuation of the disk brake 10 is independent of the direction of rotation [[48]] of the brake disk 16 and the displacement is always effected in the same direction. A frictional force exerted by the rotating brake disk 16 on the movable friction brake lining 26

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pressed against it now urges the friction brake lining 26 in the direction of the widening wedge gap between the oblique face 30 and the brake disk 16 and presses the friction brake lining 26 against the travel limiter 46. The wedge 28 moves away from the slaving device 44; it is decoupled from the frictional force exerted by the rotating brake disk 16 on the movable friction brake lining 26. The contact pressure of the friction brake lining 26 against the brake disk 16 is brought about solely by the actuating device 38 via the wedge 28; neither self-boosting nor self-fading occurs by means of the self-boosting device 36 or the wedge mechanism. In the direction of rotation 49 of the brake disk [[15]] 16 as shown in Fig. 3, the disk brake 10 is accordingly neutral in terms of self-help. When the brake disk 16 is standing still as well, conditions are equivalent to those explained above in conjunction with Fig. 3; neither self-boosting nor self-fading occurs. This is important when the disk brake 10 is used not only as a service brake but also as a parking brake for implementing a parking brake function.

Page 10, please replace paragraph [0032] with the following amended paragraph:
[0032] To avoid lengthening the displacement travels of the wedge 28 and the movable friction brake lining 26 when wear of the friction brake linings 24, 26 occurs, or in any case to limit such lengthening, the disk brake 10 of the invention has a wear readjusting device 50. With the wear readjusting or compensating device 50, an inside diameter of the brake caliper 12, or in other words a spacing of the two brake lining mounting plates 18, 20 from one another, can be varied. To that end, the tie rods 22 are mounted fixedly in one of the brake lining mounting plates 18, while conversely the other brake lining mounting plate 20 is

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displaceable on the tie rods 22. The tie rods 22 pass through the displaceable brake lining mounting plate 20 and protrude from the brake lining mounting plate 20 on the side facing away from the brake disk 16. Nuts 52 are screwed onto the protruding ends of the tie rods 22. By synchronized rotation of the nuts 52, the brake lining mounting plate 20 can be displaced parallel to the other brake lining mounting plate 18 and an inside diameter of the brake caliper 12 can be set. This makes it possible to compensate for wear of the friction brake linings 24, 26.

Page 11, please replace paragraph [0033] with the following amended paragraph:

[0033] Another possibility for wear readjustment is shown in Fig. 4. Here the travel limiter that limits the displacement of the movable friction brake lining 26 in one direction has a set screw 54. By rotation of the set screw 54, wear of the friction brake linings 24, 26 can be compensated [[form]] for. In this case, the brake caliper 12 is rigid, and its inside diameter is not adjustable. Otherwise, the disk brake 10 shown in Fig. 4 is embodied identically to the disk brake 10 shown in Figs. 1-3 and functions in the same way. Components that match one another are identified by the same reference numerals; to avoid repetition, for an explanation of Fig. [[3]] 4 see the explanations of Figs. 1-3.

Page 12, please add the following new paragraph after paragraph [0035]:

[0036] The foregoing relates to a preferred exemplary embodiment of the invention, it being understood that other variants and embodiments thereof are possible within the spirit and scope of the invention, the latter being defined by the appended claims.